UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,488	08/19/2002	Donald Dominic Arnone	P/25-277	7432

2352 7590 05/24/2004

OSTROLENK FABER GERB & SOFFEN
1180 AVENUE OF THE AMERICAS
NEW YORK, NY 100368403

EXAMINER	
LEE, JOHN D	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 05/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/089,488	ARNONE ET AL.	
	Examiner	Art Unit	
	John D. Lee	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *26,30-36,38-45,47 and 48* is/are allowed.

6)☒ Claim(s) *27-29,37 and 46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 August 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0302*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

This application has been filed under 35 U.S.C. § 371 as the United States national stage application of International Application PCT/GB00/03709 (filed September 27, 2000). In a preliminary amendment, applicant has canceled original claims 1-25 in favor of new claims 26-48. Claims 26-48 are thus subject to examination herein.

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. §§ 119(a)-(d) or (f). A copy of the certified copy of the priority document has been received in this National Stage Application from the International Bureau (PCT Rule 17.2(a)).

The drawings are objected to because of the following informalities. **Figure 3** (the third drawing sheet) should actually be individually labeled as **Figures 3(a)** and **3(b)**. **Figure 5** (on the fourth drawing sheet) should actually be labeled as **Figure 5(a)**. The two figures on the fifth drawing sheet (currently labeled as **Figure 5(cont'd)**) should be individually labeled as **Figures 5(b)** and **5(c)**. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The title of the invention is not sufficiently descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The disclosure is objected to because of the following informalities: on page 13, the reference to "**Figure 8**" should actually be to "**Figures 8(a) and 8(b)**"; and the third printed line on page 14 should be rewritten so as to read "Figures 17(a) and 17(b)". Appropriate correction is required. Applicant's cooperation is requested in correcting any other errors of which applicant may become aware in the specification.

Claims 32 and 46-48 are objected to because of the following informalities: Claim 32 should be dependent from claim 31 rather than from claim 30 in order to provide correct antecedent support for "the Ohmic contacts". The first word of claim 46 ("a") should be capitalized. In claim 47, line 3, "wit" should be "with". Claim 48 should be dependent from claim 47 rather than from claim 46 in order to provide correct antecedent support for "the applied magnetic field" and "the optical fluence". In the third-from-last line of claim 48, "point" should be "step". Appropriate correction is required.

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 46 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This claim is totally indefinite in that it purports to describe a "method", but there are no method steps laid out. Only a few limitations regarding a device (the "radiation source") are set forth in this claim – no method steps at all! The Examiner thus cannot decipher the intended claimed method.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 27 is rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Sarukura et al (JOURNAL OF APPLIED PHYSICS, July 1998, submitted by applicant). Sarukura et al discloses a radiation source comprising a frequency conversion member (InAs sample) configured to emit a beam of radiation in the THz frequency range in response to irradiation with an input beam of a frequency of about 800 nm, with the sample being subjected to a magnetic field. Notice that the descriptions set forth in the last two lines of this claim ("the magnetic field and fluence of the input beam being configured to minimize the screening effect of free carriers in the frequency conversion member") are not limitations of the radiation source which is being claimed, but are rather limitations to the magnetic field and the input beam of light which are not part of the radiation source itself and which are not therefore being claimed. Sarukura et al thus discloses every limitation of the claimed radiation source.

Claims 28 and 29 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by U.S. Patent 4,943,145 to Miyata. Miyata discloses a radiation source comprising a frequency conversion member (display medium **21**) configured to emit a beam of radiation at a wavelength λ_2 in response to irradiation with an input beam of a wavelength λ_1, wherein λ_2 is different from λ_1. The frequency conversion member (display medium **21**) is an electro-luminescent material such as ZnS doped with the magnetic material dopant Mn. Miyata thus discloses every limitation of the claimed radiation source.

Claim 37 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Sarukura et al (JOURNAL OF APPLIED PHYSICS, July 1998, submitted by applicant). The InAs sample in Sarukura et al is placed at 45° to the input beam so that the emitted THz radiation beam is produced by reflection from a surface of the InAs sample. Sarukura et al discloses that, depending upon the magnitude of the applied magnetic field, a variation in polarization of the emitted THz beam can be induced (**Figures 5(a, b, and c)** and associated disclosure). Therefore, although not explicitly stated in the reference, it is obvious that the magnetic field will have a "component" parallel to that of the emitted beam. The radiation source of claim 37 would thus have been obvious to a person of ordinary skill in the art in view of the Sarukura et al reference.

Claims 26, 30-36, 38-45, 47, and 48 are allowable over the prior art of record. Sarukura et al and Miyata (discussed above) are the closest prior art documents known. Neither of these documents discloses or reasonably suggests the radiation sources and methods of these claims. Regarding claim 26 (and claims depending therefrom), the prior art does not disclose or suggest a radiation source comprising a frequency conversion member configured to emit a beam of radiation at one frequency in response to irradiation with an input beam of a different frequency, with the sample being subjected to a magnetic field, wherein the free carrier concentration of the frequency conversion member and the applied magnetic field are configured such that the cyclotron diameter of the free carriers of the frequency conversion member is within 30% of their scattering length. Note that, unlike the discussion in the rejection of claim 27 (above), the descriptions set forth in the last three lines of this claim ***are*** limitations of

the radiation source which is being claimed. Regarding claim 30 (and claims depending therefrom), the prior art does not disclose or suggest a radiation source comprising a frequency conversion member configured to emit a beam of radiation at one frequency in response to irradiation with an input beam of a different frequency, with the sample being subjected to a magnetic field, wherein the source includes means for applying an electric field at the surface of the frequency conversion member. Regarding claims 47 and 48, the prior art does not disclose or suggest a method of ***optimizing*** a radiation source comprising the specifically recited steps therein.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 5,379,311 to McFarlane et al describes a frequency upconversion waveguide which includes an active layer doped with, for example, Mn.

All of the prior art documents submitted by applicant in the Information Disclosure Statement filed on March 27, 2002, including the Sarukura et al article relied on in some of the rejections above, have been considered and made of record. Note the attached initialed copy of form PTO-1449.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the

examiner to consider the applicability of 35 U.S.C. § 103(c) and potential 35 U.S.C. §§ 102(e), (f) or (g) prior art under 35 U.S.C. § 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (571) 272-2351. The Examiner's normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562, to the technical support staff supervisor (Team 8) at telephone number (571) 272-1564, or to the Technology Center 2800 Customer Service Office at telephone number (571) 272-1626.

John D. Lee
John D. Lee
Primary Patent Examiner
Group Art Unit 2874